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<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/516,373	WINK ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jurie Yun	2882	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to IDS filed 2/23/06.
2. ☒ The allowed claim(s) is/are 1-25.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date <u>11/30/04, 2/23/06</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material  | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

**DETAILED ACTION**

1. The preliminary amendment filed 4/15/05 has been entered.

**EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Douglas B. McKnight on 5/30/06.

The application has been amended as follows:

Delete the abstract and replace with the following new abstract:

--A method and apparatus of generating a hybrid three dimensional reconstruction of a vascular structure affected by periodic motion is disclosed. At least two x-ray images of the vascular structure are acquired. Indicia of the phases of periodic motion are obtained and correlated. Images from a similar phase of periodic motion are selected and a three dimensional modeled segment of a region of interest in the vascular structure is generated. A three dimensional volumetric reconstruction of a vascular structure is generated that is larger than the modeled segment. The modeled segment of interest and the volumetric reconstruction of the larger vascular structure are combined and displayed in human readable form.--

In claim 16, line 1, delete "1" and replace with --10--

In claim 19, line 1, delete "8" and replace with --18--

***Allowable Subject Matter***

3. Claims 1-25 are allowed.

4. The following is an examiner's statement of reasons for allowance: Prior art fails to disclose a method of generating a hybrid three dimensional reconstruction of a vascular structure affected by periodic motion, the method comprising generating a three dimensional modeled segment of a region of interest in the vascular structure, the modeled segment reconstructed using the selected X-ray images from a similar phase of periodic motion, the region of interest only a portion of the imaged vascular structure, generating a three dimensional volumetric reconstruction of a vascular structure larger than the modeled segment, combining the modeled segment of interest and the volumetric reconstruction of the larger vascular structure, and displaying in human readable form the combined reconstructed vascular model and volumetric reconstruction, as claimed in claims 1 and 17. Claims 2-9 are allowed due to their dependency on claim 1, and claims 18-25 are allowed due to their dependency on claim 17.

Prior art fails to disclose an apparatus for generating a hybrid three dimensional reconstruction of a vascular structure affected by periodic motion, the apparatus comprising means for generating a three dimensional modeled segment of a region of interest in the vascular structure, the modeled segment reconstructed using the selected x-ray images from a similar phase of periodic motion, the region of interest only a portion of the imaged vascular structure; means for generating a three dimensional

volumetric reconstruction of a vascular structure larger than the modeled segment; means for combining the modeled segment of interest and the volumetric reconstruction of the larger vascular structure; and means for displaying in human readable form the combined reconstructed vascular model and volumetric reconstruction, as claimed in claim 10. Claims 11-16 are allowed due to their dependency on claim 10.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hsieh et al. (USPN 6,639,965 B1) disclose methods for cardiac imaging with conventional CT. Rasche et al. (USPN 6,959,067 B2) disclose an X-ray imaging method and a 3D-rotational X-ray apparatus for applying the method. Edic et al. (US 2003/0123718 A1) disclose an apparatus and method for volumetric reconstruction of a cyclically moving object. Evron et al. (US 2003/0078500 A1) disclose a system and method for 3D reconstruction of an artery. None of the cited references disclose combining a modeled segment of interest and a volumetric reconstruction of the larger vascular structure, and displaying in human readable form the combined reconstructed vascular model and volumetric reconstruction.

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jurie Yun whose telephone number is 571 272-2497.

The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

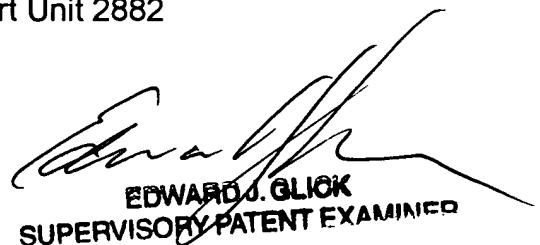
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

May 27, 2006



Jurie Yun  
Examiner  
Art Unit 2882



EDWARD J. GLICK  
SUPERVISORY PATENT EXAMINER